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NOTE

UV-Spectrophotometric Determination of Torsemide and Fenoverine

D. GOWRI SANKAR*, P. JOY BABU, N. SUJATHA and P.V. MADHAVI LATHA
Department of Pharmaceutical Sciences, Andhra University, Visakhapatnam-530 003, India
E-mail: gowrisankar97@rediffmail.com

A new, simple, accurate and sensitive UV spectrophotometric method has been developed for the determination of torsemide (TSM) and fenoverine (FNV) in pure form and pharmaceutical formulations. These methods exhibit maximum absorption (λ_{max}) at 228 nm for TSM and 232 nm for FNV and both the drugs obey Beer's law in the concentration range 5–25 μg/mL respectively. The methods were extended to pharmaceutical formulations and there was no interference from any common pharmaceutical additives and excipients. The results of analysis have been validated statistically and by recovery studies.

Key Words: UV spectrophotometric determination, Torsemide, Fenoverine.

Torsemide[1] (TSM) is an antidiuretic drug and chemically it is 3-pyridine sulfonamide N-[[(1-methylethyl)amino]-carbonyl]-4-[(3-methylphenyl)amino]. Fenoverine[2] (FNV) is a calcium channel blocker and antispasmodic drug. Chemically FNV is 10H-phenothiazine, 10-[[4-(3-benzodioxol-5-ylmethyl)-1-piperazinyl]acetyl]. A survey of literature reveals that both the drugs TSM or FNV are estimated by HPLC method in human plasma[1–4], for pure and pharmaceutical dosage form and no spectrophotometric method has been reported for the estimation of TSM or FNV. The authors have developed two simple, accurate and reliable UV spectrophotometric methods for the estimation of TSM and FNV in pure as well as in pharmaceutical dosage forms.

All the chemicals used were of analytical grade.

Spectral and absorbance measurements were made on Systronics UV-Vis spectrophotometer-117 with 10 mm matched quartz cells.

Preparation of standard solut ion: Accurately weighed 100 mg of TSM or FNV was dissolved in 100 mL of methanol. The stock soution was further diluted with methanol to obtain a working standard of 100 μg/mL.

Preparation of sample solution: An accurately weighed tablet powder of TSM equivalent to 100 mg of drug was dissolved in 100 mL of methanol and filtered. This solution was further diluted with methanol to obtain a concentration of 100 μg/mL. An accurately weighed capsule powder of FNV equivalent to 100 mg was dissolved in 100 mL of methanol and filtered. This solution was further diluted with methanol to obtain a concentration of 100 μg/mL.

Assay procedure for TSM and FNV: Aliquots of solution 0.5–2.5 mL (100 μg/mL for TSM or FNV) were transferred into a series of 10 mL volumetric flasks and the volume was brought up to the mark with methanol. The absorbance was

measured at 228 nm for TSM and 232 nm for FNV against a reagent blank. The amount of TSM and FNV present in the sample solution was computed from the calibration curves.

The optical characteristics such as Beer's law limits, Sandell's sensitivity, molar extinction coefficient, per cent relative standard deviation (calculated from the eight measurements containing 3/4th of the amount of the upper Beer's law limits), regression equation, correlation coefficients, % range of error (0.05 and 0.01 confidence limits) were calculated and the results are summarized in Table-1.

TABLE-1
OPTICAL CHARACTERSTICS AND PRECISION OF THE PROPOSEDMETHODS

Parameters	TSM	FNV
λ_{max} (nm)	264	258
Beer's law limit (μg/mL)	5–25	5–25
Molar absorptivity (L mol^{-1} cm^{-1})	8.36×10^4	1.28×10^4
Sandell's sensitivity (μg cm^{-2}/0.001 absorbance unit)	0.046	0.035
Regression equation (Y = a + bC):		
Slope (b)	0.02416	0.02816
Intercept (a)	–0.0006	–0.0006
Correlation coefficient (r)	0.9999	0.9999
Relative standard deviation (%)*	0.8187	1.1607
%Range of error (confidence limits)*:		
0.05 level	0.6845	0.9705
0.01 level	1.0127	1.4357

*Average of eight determinations

To evaluate the validity and reproducibility of the methods, known amounts of pure drug were added to previous pharmaceutical preparations and the mixtures were analyzed by the proposed methods and the results are presented in Table-2. Interference studies revealed that the common excepients and other additives did not interfere. Hence the method is most economic, simple, sensitive and accurate and can used for the routine dermination of TSM or FNV in bulk form as well as in pharmaceutical preparations.

TABLE-2
ESTIMATION OF TSM AND FNV IN PHARMACEUTICAL FORMULATIONS

Sample		Labelled amount (mg)	Amount found (mg) Proposed method	Recovery (%)*
Torsemide:	Tablet I	100	101.30	101.30
	Tablet II	100	100.16	100.16
Fenoverine:	Capsules I	100	100.80	100.80
	Capsules II	100	99.14	99.14

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